

Appendix K

Example Tools And Procedures

There are numerous factors that must be considered when employing target acquisition assets on the battlefield. The purpose of this appendix is to provide a collection of formats, procedures, and ideas that have been collected from Combat Training Centers (CTCs), and TO&E units that can be used to facilitate radar mission planning and employment. Most of the forms and procedures can be modified to meet changing unit requirements

FIREFINDER RADAR SECTION TROOP LEADING PROCEDURES

Employment of Firefinder radars must meet the commander's intent/guidance and be synchronized with the scheme of maneuver. Troop leading procedures and the radar section leader's involvement in the planning process are essential for successful radar employment and responsive counterfire. The radar section leader requires usable tools to facilitate mission preparation and execution. The ability to develop and issue clear warning orders, time lines, pre-combat checks, pre-combat inspections, and priorities of work are key to any successful mission.

Troop leading procedures provide the required guidance to focus the radar section's preparation for and execution of the radar employment plan. Using standard troop leading procedures helps clarify mission requirements, fix responsibilities and make the best use of available time. Troop leading procedures provide a vehicle for preparing the section for operation and help free the radar section leader to participate in the DS battalion's counterfire planning process.

SUGGESTED TROOP LEADING PROCEDURES

- Receive the mission (SITTEMP, operations graphics, RDO/execution matrix).
 - Perform mission analysis, assess threat (S2/G2, radar section leader, section chief).
 - Review critical tasks, positioning guidance, planned zones (S2/G2, radar section leader, section chief).
 - Prioritize pre-combat inspections (PCIs) and pre-combat checks (PCCs), (radar section leader, section chief).
 - Prepare a timeline (radar section leader, section chief).
 - Conduct risk assessment/management.
- Issue a concise warning order to your section, (radar section leader).
 - Section mission.
 - Positioning guidance.

- Threat and counter measures.
 - PCI priorities.
 - Timeline.
- Make a tentative plan, (radar section leader, section chief).
 - METT-TC Considerations.
 - Logistical resupply.
 - Survivability measures.
 - Section rehearsals, (site occupations/displacements, defense, etc.).
- Initiate movement, (radar section leader, section chief).
 - Conduct PCIs.
 - Perform rehearsals.
 - Issue movement order and risk assessment.
- Conduct reconnaissance, (radar section leader or section chief).
 - Select sites to support mission requirements.
 - Perform/coordinate survey requirements.
 - Make site assessments for survivability, maneuver support, site defense, etc.
- Complete the plan, (radar section leader, section chief).
 - Report site assessments to S2/G2.
 - Prepare a verbal order for section.
 - Develop route strip maps, preliminary site defense plan.
 - Develop battle-tracking overlays for reconnaissance vehicle and shelter.
- Issue the order, (radar section leader, section chief).
 - Focus on movement, positioning, site defense and survivability measures.
 - Be clear and concise.
 - Require a back brief from the section chief and senior radar operators. This should be a section huddle, each member must understand their role.
- Supervise, (radar section leader, section chief).
 - Final PCIs.
 - Crew drill rehearsals for occupations, site, defense, shelter, and NBC operations.
 - Execution.

Troop leading procedures can and should be modified to facilitate planning and execution of each mission. The steps do not have to happen sequentially and may happen simultaneously as METT-TC dictates.

RADAR SECTION WARNING ORDER (WARNO)

The warning order (WARNO) given to the radar section must specify the initial mission statement and tasks required to perform the mission. The example in Figures K-1 and K-2, Radar Section WARNO, provide a tool for

the extraction of pertinent information from the MDMP and subsequent briefings. This example can be modified as required.

RADAR SECTION WARNO			
SITUATION			DTG:
ENEMY:	THIS UNIT FACES THE FOLLOWING ENEMY FORCES;		
SIZE:		FORMATION:	
ENEMY ARTILLERY:			
ELINT THREAT:			
FRIENDLY:	THIS UNIT WILL CONDUCT	OFFENSIVE OR DEFENSIVE OPNS	
	WE WILL LD OR BE READY TO DEFEND NLT:	DTG:	
SECTION MISSION		DS OR GS	
EXECUTION:			
CRITICAL TASKS:			
CONDUCT THE FOLLOWING PCCs IN PRIORITY:		(1)	
(2)	(3)	(4)	
(5)	(6)	(7)	
TIMELINE OF CRITICAL EVENTS:		DTG:	
EVENT:		TIME/LOCATION IF APPROPRIATE	
FA ROCK DRILL			
FA TECH REH/CF BATTLE DRILL			
FS REHEARSAL			
PCC/PCIs COMPLETED NLT:			
OPORD BRIEF			
RECON/SITE SELECTION			
MOVEMENT/R3P			
READY TO OBSERVE NLT:			

Figure K-1. Radar Section Warning Order

RADAR SECTION WARNO (CONT.)			
SERVICE AND SUPPORT			
CLASS:	RESUPPLY TRIGGER:		
I			
III			
IV			
V			
VIII			
LRP/R3P DATA:			
COORDINATION FOR EXTERNAL SUPPORT:			
DS RDR/MAINT:			
VEHICLE RECOVERY:			
COMMAND AND SIGNAL			
SOI ADDITION/DIGITAL COMSEC:			
REPORTING FREQUENCIES: VOICE:		DIGITAL:	
MEDEVAC/CAS FREQUENCY:		CALL SIGN:	
CHALLENGE/PASSWORD:		DTG:	
PRIORITIES OF WORK			
1			
2			
3			
4			
5			
6			
7			
8			

Figure K-2. Radar Section Warning Order (cont.)

RADAR DEPLOYMENT ORDER DA FORM 5957-R

(CLASSIFICATION WHEN FILLED IN)

RADAR DEPLOYMENT ORDER							
For use of this form, see FM 6-121. The proponent agency is TRADOC.							
SECTION		Q-36/Q-37		MISSION			
LOCATION	Primary			Alternate			
SEARCH SECTOR							
	Left Edge	Right Edge	Minimum Range	Maximum Range			
Primary Azimuth	mils	mils	meters	meters			
Alternate Azimuth	mils	mils	meters	meters			
EW THREAT ASSESSMENT							
EW Threat (Yes or No)		Affecting Friendly Assets (Yes or No)		Type of Threat (Air or Ground)			
NOTE: Use the Firefinder survivability flowchart in FM 6-121 to determine emission limits.							
CUEING AGENTS (CALL SIGN AND DESIGNATION) IN PRIORITY							
REPORTING CHANNELS							
ZONE DATA							
Type and Number	Description and/or Command Priority	Grid Coordinates of Zone Corner Points					

DA FORM 5957-R, OCT 2000

(CLASSIFICATION WHEN FILLED IN)

Figure K-3. Radar deployment Order

RADAR EXECUTION MATRIX

The formal radar deployment order, Figure K-3 (RDO), can be modified to make it more useful and practical. Figure K-4 contains a format for a radar execution matrix. This matrix is a modified version of the RDO. The matrix is a valuable tool that can be used as is or modified to reflect the phases or events of an operation. Figure K-5 shows another example of a modified RDO/execution matrix. This example includes a terrain graphic. NOTE: The radar execution matrix may become classified when filled in and must be properly labeled.

[illegible]

Figure K-4. Radar Execution Matrix

[illegible]

K-7

QUICK REFERENCE POSITION SELECTION WORKSHEET

The following is an example of a quick reference position selection worksheet. This tool may be used with other IPB products in the selection of radar positions.

QUICK REFERENCE POSITION SELECTION WORKSHEET	
METT-TC	
MISSION:	Know the critical fire support tasks, the maneuver commanders force protection priorities and understand the scheme of maneuver, (FA ORDERS PROCESS, combined Arms and Fire Support rehearsals).
ENEMY:	Know the enemy situation, most recent spot reports, templated chemical strike locations, FASCAM, obstacles, avenues of approach, (SITE MP, S2, Intel SIT map).
TERRAIN:	(Weather), Know the terrain so it can be used to your advantage. Use it to mask your movement, provide cover and concealment, screening crests etc. Additionally, know the severely restricted terrain areas, slope and masking problem areas. Don't forget weather, heavy rains and high winds can degrade operations.
TROOPS:	Know the adjacent unit and concentration of friendly troops in the AO, also coordinate support for MEDEVAC, AID station, DECON and EPW requirements.
TIME:	Consider the time available for reconnaissance, coordination, movement, occupation and site preparation.
CIVIL:	Consider radar impact on civilian population, hostile local populace and security of section personnel
SITE ASSESSMENT CHECKLIST	
Does this position optimize the probability of the acquisition of templated enemy artillery fires?	
Considering the doctrinal phases and focus of enemy fires, does this position provide the optimum aspect angle?	
Does the position maximize the usage and cover and concealment?	
Is the position defensible?	
Does this position provide good counter measures for an ELINT threat, (screening crest, tunneling etc.)?	
Is there an adjacent unit to provide security?	
NOTE: Plot as much data as possible on the map used to navigate and battle track. Monitor the appropriate frequencies to receive intell updates. Always prepare a site assessment for each site selected and back brief the S2. Plan and mark the routes to and from selected radar sites, make a strip map and ensure you give copies to the section chief.	

Figure K-6. Quick Reference Position Selection Worksheet

RADAR POSITIONING AND MOVEMENT SYNCHRONIZATION CHECKLIST

The radar positioning and movement synchronization checklist can be used in conjunction with the RDO or Execution Matrix, and the quick reference position selection worksheet to assist in synchronizing the radar with the fire support plan.

RADAR POSITIONING AND MOVEMENT SYNCHRONIZATION CHECKLIST	
REQUIRED INFORMATION/LOCATION	KNOWN DATA
TEMPLATED THREAT ARTILLERY LOCATIONS, RAG: SITE MP	
OBJECTIVE AREAS, (WHERE THE ENEMY WILL FOCUS INDIRECT FIRES): OPNS MAP	
ENEMY AVENUES OF APPROACH AND OTHER KNOWN THREAT DATA	
MAIN AVEs OF APPROACH	
RECON AVEs OF APPROACH	
TEMPLATED CHEM STRIKES, FASCAM, OBSTICLES	
TERRAIN RESTRICTIONS: MCOO	
MOVEMENT/POSITIONING TERRAIN LIMITATIONS, I.E. RESTRICTED OR SEVERLY RESTRICTED TERRAIN, SLOPE AND SCREENING CREST	
VISIBILITY PROBLEM AREAS, INTERVENING CRESTS, OPTIMUM ASPECT ANGLE/RANGE CONSIDERATIONS	
COMMUNICATION CONSIDERATIONS, RANGE, RETRANS, REPORTING CHANNELS, DIGITAL LINKS	
SERVIVABILITY MEASURES, (ADJACENT UNIT COORDINATION, EW CONSIDERATIONS	
REMARKS:	
NOTE: Fill in required data in known data field, the majority of this information should be posted on a battle map and used to navigate and facilitate site selection.	

Figure K-7. Radar Position and Movement Synchronization Checklist

VOICE RADAR REGISTRATION PROCEDURE

The following is an example of how to perform a radar registration using FM voice communications.

- **BN FDC** (BTRY FDC), this is (BN FDC), Perform (type) (Radar) registration at grid _____, altitude _____, over.
- **(BTRY) FDC** Perform (type) (Radar) registration at grid _____, Altitude _____, out.
- **(BTRY) FDC** (Radar) This is (BTRY FDC), prepare to copy, over.
- **(RADAR)** (BTRY FDC) This is (Radar), prepare to copy, out.
- **(BTRY) FDC** (Radar) This is (BTRY FDC), observe (type) (IE: MPI, High burst, datum plane) registration, at grid _____, altitude _____, MAX ORD _____, QE _____ (specify if meters or feet), and HEIGHT OF BURST _____ (if a high burst or datum plane), firing unit grid _____, firing unit altitude _____, report ready to observe, over.
- **(RADAR)** Observe (type) registration at grid _____, altitude _____, max ord _____, QE _____, and height of burst _____ (if necessary), firing unit grid _____, firing unit altitude _____, will report ready to observe, out.
- **(RADAR)** (BTRY FDC) this is (Radar), ready to observe, request shot and splash, over.
- **(BTRY) FDC** Request shot and splash, out.
- **(BTRY) FDC** (BTRY), Shot, over.
- **(RADAR)** (BTRY), Shot, out.
- **(BTRY) FDC** (BTRY), Splash, over.
- **(RADAR)** (BTRY), Splash, out.
- **(RADAR)** (BTRY FDC) Did hit grid _____, over.
- **(BTRY) FDC** Did hit grid _____, out.

At this point repeat the last 6 steps until the necessary number of good rounds have been observed by radar. BN FDC will end mission.

- **(BN FDC)** (Radar) and (BTRY FDC), this is (BN FDC), End of mission, over.
- **(RADAR)** End of mission, out.
- **(BTRY) FDC** End of mission, out.

NOTE: Height of burst for Radar Registrations is the height of registration point plus height of ground above sea level (The height of the registration point above sea level). Radar will forward did hit information for each to BN/BTRY FDC via normal mode of communication.

VOICE RADAR ADJUST FIRE MISSION

The following is an example for performing a Radar adjust fire mission using voice FM communications.

- **(RADAR)** (BN FDC), This is (Radar), Hostile weapon (Number and type of possible) firing, at grid _____, Altitude _____, Time _____, over.
- **BN FDC** Hostile weapons firing at grid _____, out.
- **BN FDC** (BTRY FDC), This is (BN FDC), conduct adjust fire mission with (Radar), at grid _____, Altitude _____, over.
- **(BTRY) FDC** Conduct (Radar) Fire Mission, at grid _____, altitude _____, out.
- **(BTRY) FDC** (Radar), This is (BTRY FDC), authenticate _____, over.
- **(RADAR)** I authenticate _____, out.
- **(BTRY) FDC** (Radar), This is (BTRY FDC), MAX ORD _____, QE _____, ALTITUDE _____. Request ready to observe, over.

NOTE: (BTRY) will also have to provide grid and altitude of firing BTRY (center gun) if Radar does not have this information already.

- **(RADAR)** Max ord _____, QE _____, ALTITUDE _____ out. (At this point, wait while Radar loads their computer with information.)
- **(RADAR)** (BTRY FDC), This is (Radar). Ready to observe, request shot and splash, 1 round, over.
- **(BTRY) FDC** Request shot and splash, 1 round, out. (Wait for guns to fire.)
- **(BTRY) FDC** (BTRY), Shot, over.
- **(RADAR)** (BTRY), Shot, out.
- **(BTRY) FDC** (BTRY), Splash, over.
- **(RADAR)** (BTRY), Splash, out.
- **(RADAR)** (BTRY FDC), Did-hit grid is _____, over.
- **(BTRY) FDC** Did-hit grid _____, out. (At this point (BTRY) makes corrections.) NOTE: Subsequent adjust rounds may be required.
- **(RADAR)** (BTRY FDC), This is (Radar), fire for effect, request shot and splash, over.
- **(BTRY) FDC** Fire for effect, request shot and splash, out.

At this point, Radar will follow the mission, like a friendly fire mission, to compile did-hit information.

- **(BTRY) FDC** (BTRY FDC), Shot, over.
- **(RADAR)** (BTRY FDC), Shot, out.
- **(BTRY) FDC** (BTRY FDC), Splash, over.
- **(RADAR)** (BTRY FDC), Splash, out.

Repeat the previous 4 steps until (BTRY) completes rounds and Radar logs did-hit information.

- **(BTRY) FDC** (Radar), This is (BTRY FDC), Rounds complete, over.
- **(RADAR)** (BTRY FDC), Rounds complete, out.
- **(RADAR)** (BTRY FDC), This is (Radar). End of mission, over.
- **(BTRY) FDC** (Radar), End of mission, out.

Radar will then forward did-hit information to BN/BTRY FDC via normal mode of communications.

JOINT AIRLIFT INSPECTION CHECKLIST

DD Form 2133 is used by the Military Airlift Command for the inspection of equipment to be loaded on military aircraft.

JOINT AIRLIFT INSPECTION RECORD											PAGE		OF		PAGES	
(See Instructions on back.)																
1. UNIT BEING AIRLIFTED					2. DEPARTURE AIRFIELD					3. DATE (YYYYMMDD)						
4. AIRCRAFT TYPE AND MISSION NUMBER					5. LOAD/CHALK NO.		6. START TIME		7. COMPLETE TIME		8. TALCE/CDF					
LEGEND (Mark blocks after each item as follows) ✓ = SATISFACTORY X = UNSATISFACTORY IF NOT APPLICABLE, LEAVE BLANK											INCREMENT/SERIAL/BUMPER NUMBER AND TYPE					
A. DOCUMENTATION																
9. MANIFESTS/LOAD PLANS																
10. SHIPPERS DECLARATION																
11. HAZARDOUS MATERIALS PREPARATION																
12. LOAD LISTS/CARGO TRANSFER FORMS																
B. VEHICLES/NON-POWERED EQUIPMENT																
13. CLEAN																
14. FLUID LEAKS																
15. MECHANICAL CONDITION																
a. ENGINE RUNS																
b. BRAKES OPERATIONAL																
16. BATTERY																
a. SECURE - NO LEAKS																
b. POST/CABLES PROTECTED																
17. FUEL TANK(S) LEVELS																
a. AS REQUIRED																
b. FUEL TANK CAPS INSTALLED																
18. JERRY CANS																
a. DOT 5L (Metal)																
b. POP (Plastic)																
19. DIMENSIONS (Fits A/C Profile or Contour)																
20. CENTER OF BALANCE (Both Sides)																
21. SCALE WEIGHT (Both Sides)																
22. AXLE WEIGHTS (Both Sides)																
23. TIEDOWN POINTS (Serviceable)																
24. PINTLE HOOKS/CLEVISSES																
a. SERVICEABLE																
b. SAFETY PIN ATTACHED (Safety Chains)																
25. VEHICLE EQUIPMENT SECURE (Tools, tires, etc.)																
26. TIRE PRESSURE																
27. SHORING (Rolling, Parking, Sleeper, Approach)																
28. ACCOMPANYING LOAD																
a. WITHIN VEHICLE RATED CAPACITY																
b. SECURE TO VEHICLE																
29. LOX/NITROGEN CART (Vent Kit)																
C. PALLETS/PALLET TRAINS																
30. CLEAN																
31. SCALE WEIGHT																
32. DIMENSIONS (Fits A/C Profile or Contour)																
33. CARGO PROPERLY SECURED																
a. NETTED																
b. CHAINED/STRAPPED																
34. DUNNAGE (3 Pieces Per Pallet)																
D. HELICOPTERS (Flyaway)																
35. FUEL QUANTITY (Gallons)																
36. BATTERY (Disconnected/Taped)																
37. CENTER OF BALANCE (Both Sides)																
38. SCALE WEIGHT (Both Sides)																
39. SHORING (Rolling, Parking, Approach)																
40. SPECIAL LOADING EQUIPMENT (Towbars, etc.)																
41. REMARKS																
THE ABOVE LISTED ITEMS HAVE BEEN INSPECTED FOR PROPER SHIPPING CONFIGURATION.																
42. DEPLOYING FORCE REPRESENTATIVE (Signature/Rank/Unit of Assignment)											43. MOBILITY FORCE INSPECTOR (Signature/Rank/Unit of Assignment)					

DD FORM 2133, OCT 1998 (EG)

PREVIOUS EDITION IS OBSOLETE.

Figure K-8. Joint Airlift Inspection Record (side 1)

INSTRUCTIONS
<p>1. RESPONSIBILITIES</p> <p>1.1. Qualified TALCE/CDF or aerial port personnel are responsible for acceptance of cargo for airlift.</p> <p>1.2. The deploying unit is responsible for the preparation of cargo, including weighing, marking, palletization, and the preparation of all documentation.</p> <p>1.3. The joint inspection, including documentation and inspection of all items prepared for air shipment, must be accomplished prior to loading. This inspection will be performed by qualified TALCE/CDF or aerial port personnel with a representative from the transported force.</p> <p>2. INSPECTION PROCEDURES</p> <p>2.1. All inspections will be conducted by qualified inspectors and transported force representatives. The TALCE/CDF or aerial port representative accepting cargo for air shipment must have completed hazardous materials inspector training required by paragraph 1.17.3, AFJMAN 24-204/TM 38-250/NAVSUP PUB 505/MCO P4030.19F/DLAM4145.3. The completed form will indicate to the aircraft loadmaster that the required inspection has been accomplished.</p> <p>2.2. This form will be used as the source document for joint inspection. Three copies will be completed for each aircraft load and sign by the appropriate personnel.</p> <p>(1) One signed copy will be attached to the aircraft cargo manifest.</p> <p>(2) One signed copy for the TALCE/CDF or aerial port station file.</p> <p>(3) One signed copy for the transported force.</p> <p>3. PREPARATION INSTRUCTIONS</p> <p>3.1. Heading.</p> <p>(1) Block 1, Unit Being Airlifted. Enter the numerical designation and geographic location of the military unit responsible for the equipment being airlifted. For example, 1st Tactical Fighter Wing, Langley AFB VA.</p> <p>(2) Block 2, Departure Airfield. Enter the name of the facility the airlifted unit is departing, i.e., Langley AFB VA.</p> <p>(3) Block 3, Date. Day, month and year that the inspection is accomplished.</p> <p>(4) Block 4, Aircraft Type and Mission Number. Enter the aircraft type on which the equipment is to be loaded and the airlift mission number as designated in the plan or operations order.</p> <p>(5) Block 5, Load/Chalk Number. Enter the deploying force assigned aircraft load number that establishes the desired load movement sequence.</p> <p>(6) Block 6, Start Time. Enter the local time that the inspection was started.</p> <p>(7) Block 7, Complete Time. Enter the local time that the load was checked, and is ready for movement.</p> <p>(8) Block 8, TALCE/CDF. Enter the numerical designation of the unit that has TALCE/CDF or aerial port responsibility for the operating location.</p> <p>3.2. Body.</p> <p>(1) Enter the increment/serial/bumper number and type of equipment in the appropriate block. The legend for completing the inspection is contained in the block on the left. Annotate the appropriate entry in the proper column. Make only one entry in each inspection block for each item.</p> <p>(2) Enter items not initially accepted in the remarks section and indicate corrective action.</p> <p>(3) Blocks 42 and 43. Signature must be legible. Indicate the rank and unit of assignment of the individual signing the form.</p>

DD FORM 2133 (BACK), OCT 1998

Figure K-9. Joint Airlift Inspection Record (side 2)

RISK MANAGEMENT WORKSHEET

The risk management worksheet provides a starting point to logically track the process of assessing hazards and risks. It is used to document risk management steps taken during the planning, preparation, and execution of training and combat missions and tasks. Use the following guidelines for completing the worksheet:

- Block A-D: Self explanatory.
- Block E: Identify the specific task relating to the mission or overall task to be performed.
- Block F: Identify Hazards – Identify hazards by reviewing METT-TC factors for the mission or task.
- Block G: Assess Hazards – Assessment includes historical lessons learned, intuitive analysis, experience, judgment, equipment characteristics and warnings, and environmental considerations. Determine the initial risk for each hazard by assessing the probability and severity.
- Block H: Develop Controls – Develop one or more controls for each hazard that will either eliminate the hazard or reduce the risk of a hazardous incident. Specify who, what, where, why, when and how for each control.
- Block I: Determine Residual Risk – Determine the residual risk for each hazard by assessing the probability and severity.
- Block K: Determine Overall Mission/Task Risk – Select the highest residual risk level and circle it. This becomes the overall mission or task risk level. The commander decides whether the controls are sufficient to accept the level of residual risk. If the risk is too great to continue the mission or task, the commander directs development of additional controls or modifies, changes, or rejects the COA.
- Supervise and Evaluate – This step is not on the worksheet. Plan how each control will be monitored for implementation and reassess hazards as the situation changes. Determine if the controls worked and if they can be improved. Pass on lessons learned.

A. Mission or Task:		B. Date/Time Group: Begin: End:		C. Date Prepared:	
D. Prepared By: (Rank, Last Name, Duty Position)					
E. Task:	F. Identify Hazards	G. Asses Hazards	H. Develop Controls	I. Determine Residual Risk	J. Implement Controls ("HOW TO")
K. Determine overall mission/task risk level after controls are implemented (circle one) LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (E)					

Figure K-10. Risk Management Worksheet